Mechanization of modeling, simulation, amplification, and intelligence of software

Abstract

The present invention models the software as a physical device S with causality. It develops the interaction between the software and its human intelligence in a software dynamic system setting. The software dynamic system includes the software S or a modeled software

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and the software controller that is the programmable agent A encapsulating the strategies to perform tasks in a software space. The software S is modeled analytically and numerically. Its input/output behavior is correlated and sampled based on a discrete sampling domain K. The software S is connected with the agent A in a closed-loop fashion as a software dynamic system, in which the running software S is exerted by external commands computed by the agent A while its input/output behavior is controlled

and observed in real-time in order to identify the model of the software,

$$\bar{S}$$

. The modeled software

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is connected with the same agent A again in the same closed-loop fashion as a simulation software dynamic system, in which the modeled software

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is exerted by the same commands computed by the agent A in order to simulate the interaction between the software and the agent without the real software S presence. This creates a new software that includes the modeled software

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and the agent A. The simulation software dynamic system is the

software automation machine that can be further augmented. The added programmable augmentations integrated with the agent A construct a new software device that couples the modeled software

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and a human user interactively and automatically. The programmable software device functions as the software amplifier that can magnify the modeled software dynamics and the user intelligence to enable anyone to engage the simulation interactively click-by-click and key-by-key without any failure. The modeled software

$$\overline{S}$$

that is extracted from the software S represents the underlying domain knowledge. The knowledge can be simulated in the software dynamic system with the agent as a tutor and enhanced to serve as a new intelligence – software intelligence. The present invention creates a new *software-2* that includes the modeled software

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, the software controller, and the programmable augmentations. *Software-2* is integrated with real-time communication and distributed over the Internet to run as a giant simulation machine with a new Master-Machine-Learner loop as a new interactive mechanism, and a virtualized *software-2* as a new software media. A new education system is created based on the invented software media that models the software as its sole content and source of the intelligence and co-simulated in real-time over the Internet.